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ABSTRACT

Directors of Research and Evaluation in school districts were surveyed about their methods in making school enrollment projections. The questionnaire covered school district size, minority enrollment, staff responsibility for performing projections, acceptable levels of accuracy, methodology used, special considerations, and use of the data. Fifty responses were received, primarily from school districts of over 30,000 students. The official with primary responsibility for enrollment projections was commonly employed in the department of planning or management information services, research and evaluation, or student accounting. Principals and other administrators also had input into the process. Two-thirds of the respondents aimed for a district-wide enrollment projection error rate of one percent or less. Error rates for individuals grades and for time periods beyond one year were higher. The data were primarily used for budgeting, personnel planning, building utilization, transportation, and capital improvement planning. Two approaches were generally used: (1) projection, using historical data on birth and enrollment trends; and (2) prediction, which combines this data with other variables thought to influence enrollment, often using a multiple regression equation. (This paper presents a detailed model for enrollment projection, and the questionnaire, The Survey on Enrollment Projections). (GDC)

ENROLLMENT PROJECTION : VARIATIONS ON A THEME

by

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ABSTRACT

Enrollment projection is vital to planning in any school district, yet the published literature on the subject is sparse. A few articles laying out possible methodologies exist, but there is little documentation on the methods actually in use. The authors surveyed those involved in enrollment projection to determine their methodology, the levels of accuracy they expect, and the special concerns that they have to take into account in their projections. This paper summarizes their responses.

One basic approach emerged as virtually the sole method in use by our respondents — the cohort survival, or grade retention method. This method uses the recent past to project the future. In brief, percentages of students "surviving" from one grade to the next over the most recent years are used to project enrollments for the next few years. Incoming kindergartens are projected on the basis of birth rates five years previous. The final section of this paper presents the general method of projection with the cohort survival method, using a specific example.

OVERVIEW

Enrollment patterns in the public schools are changing once again. The birth rate has been rising nationwide for several years, leading to growing elementary school enrollments while secondary enrollments continue to decline. Planning for this enrollment shift requires accurate projection of enrollments in both the short and the long term. Unfortunately, enrollment projection seems to be one of those things that everyone does but very few people talk about. Surprisingly few papers have been published on the topic and virtually no "How to . . . " manuals exist. While school district officials no doubt have found methods that work locally, few have committed their methodology to paper. Either these officials have believed their methods to be so self-evident that they needn't be elaborated or they have considered them to be so idiosyncratic that they would not apply in other districts.

In order to determine the methods actually in use, the authors circulated a questionnaire to Directors of Research and Evaluation, with a request that the survey be forwarded to the person having primary responsibility for enrollment projection in the district. Questions about district size, minority percentage, responsibility for projections, and acceptable levels of accuracy opened the questionnaire. These were followed by several open-ended questions about methodology, special considerations, and uses of projections. A copy of the questionnaire appears in the Appendix.

This paper summarizes the responses to the questionnaire. As a surprising degree of unanimity emerged on the basic method of projection, the summary will be followed by a generalized model for enrollment projections. This mo[illegible]begins with a limited range of choice among strict computational methods to derive district-wide projections, then allows a considerably larger amount of the projector's personal judgment to enter into estimating school-by-school enrollments.

Background

A review of the literature on enrollment projection procedures yielded more articles than we originally anticipated. The authors have been involved with enrollment projections for a number of years yet had encountered few articles that addressed the topic. Inquiries to associates would usually

bring the response, "Oh, I use a modified cohort survival procedure," but no references to any literature on the method.

The literature review for this paper started with an ERIC search which produced 143 entries. These citations included articles on projection procedures for public schools, community colleges, higher education, and a few in business. The second ERIC search (using tighter controls) resulted in the identification of approximately 70 articles. A review of these abstracts produced several gems that markedly increased the productivity of the search. Major finds at this point were :

1. Donald Hackmann's 1983 dissertation entitled "An Analysis of Factors which Affect the Accuracy of the Cohort-Survival Method of Enrollment Forecasting",
2. A. J. Jaffe's "Handbook of Statistical Procedures for Long Range Projections of Public School Enrollment" (ED 058 688), and
3. Victoria Bernhardt's "Projecting Student Enrollments : A Basic Step for Comprehensive School District Planning for Declining Enrollment" (ED 187 020).

In addition, an excellent review paper written by Roger Brown entitled "A Survey of Methods and Models Used for Projecting Public School Enrollment" was sent to us along with Dr. Brown's response to the questionnaire. These documents and approximately 30 other pertinent articles were reviewed.

Thomas Holy's classic article, "What Future Needs are Revealed by School Population Studies?" (1947), suggested a classification scheme for enrollment projection procedures. His categories were:

1. forecasting school enrollment from total population;
2. forecasting by analysis;
3. forecasting by mathematical techniques;
4. the Bell Telephone Co. method, in which the rate of increase in the total population is assumed to apply to increases in school enrollment;
5. the multiple factor method, which assumes that a fundamental relationship exists between certain economic factors and school enrollment;
6. forecasting by analogy.

Holy's article continues with a description of forecasting by analysis, or what we now call the cohort-survival technique.

The cohort-survival method is the most commonly reported projection procedure. However, other approaches include time-series trend fitting, Markov models, multivariate models, linear regression, and the combination of selected elements from different models.

The accuracy of projection procedures is always of interest. Two studies that indicate the differences in the literature are those of Shaw and Webster. Shaw, in a 1984 report "Enrollment Forecasting : What Methods Work Best?", compared the accuracy of the cohort-survival method, the Percentage-Survival method, and a graphic method. He concluded that all the methods can be ". . . utilized by school districts that vary greatly in size and location." Webster's 1970 article entitled "The Cohort Survival Method in the Projection of School Attendance", compared the accuracy of the cohort-survival approach with that of a regression approach. Both approaches used the same predictor variables. He reported that overall, a regression approach produced superior results, but that a cohort-survival method yielded relatively accurate projections for districts that had small year-to-year differences in the variables of the study.

While the literature speaks primarily of the cohort-survival method, the accuracy of this method may be questioned. A final portion of this review presents comments from several authors that may be relevant to the accuracy question.

Joyce King-Stoops and Robert Slaty in "How Many Students Next Year" suggest that district-wide forecasting procedures use a cohort-survival technique and that a separate set of projections be developed by building principals using a variety of other data sets. A final review of both sets of projections would result in the adoption of a final projection. In *Planning for School Building* , James MacConnell writes about general principles for forecasting school population and presents some guidelines. He states that "methods should be selected which promise to fit best the factors unique to each community."

Stanton Leggett in "How to Forecast School Enrollment Accurately – and Years Ahead" provides a number of areas where those doing projections need to keep a wary eye open. One deals with changes, ranging from changes in building patterns, community patterns, non-public school

patterns, transportation changes, integration, and national trends. He argues that all of these variables must be considered when looking at long term growth within a local community.

The literature on enrollment projection discusses multiple approaches. Although it seems to concentrate mostly on the cohort-survival method, several other methods would seem equally valid. The one thing that is missing from the published literature is any documentation of what methodologies are actually used by those entrusted with enrollment projection. That is where the current study begins.

RESPONSES TO THE QUESTIONNAIRE

Characteristics of the Responding Districts

Fifty-one responses were received, one of which was returned blank by a state official not involved in enrollment projection. The remaining 50 were primarily from districts of 30,000 students or more. Table 1 shows the distribution of district enrollments (fall, 1985 figures).

Table 1
Distribution of District Enrollments

Enrollment	Number of districts
less than 20,000	2
20,001—30,000	1
30,001—40,000	8
40,001—50,000	9
50,001—60,000	6
60,001—70,000	8
70,001—80,000	2
80,001—90,000	4
90,001—100,000	1
100,001—150,000	3
more than 150,000	6

The majority of the responding districts either have stable enrollments or are experiencing moderate

growth. Table 2 shows the distribution of enrollment changes from fall, 1984 to fall, 1985.

Table 2
Distribution of Rates of Enrollment Change

	Rate of Change	Number of districts
Declining	- 4% to - 2%	2
	-1.9% to - 0.6%	4
Stable	- 0.5% to + 0.5%	11
Growing	+ 0.6% to + 2.0%	12
	+ 2.1% to + 4.0%	10

The racial/ethnic makeup of the districts in the sample varies widely. Five districts had less than 15 percent minority students in 1985 ; seven had more than 85 percent minority students ; and the remainder were spread fairly evenly throughout the rest of the range.

The sample contains no school districts smaller than about 17,000 students. It is therefore unclear how small a district can use the methods to be outlined. The author has spoken to an official of a district of 5,000 who uses a variant of the methods which follow, but smaller suburban and rural districts frequently rely on an exhaustive census for their projections.

Responsibility for projections

The official with primary responsibility for enrollment projections is most often found either in a department of planning or management information services (15 replies), a research and evaluation office (14 replies), or a department of student accounting (13 replies). Of the remaining districts, two give the job to the facilities planning office, two to a department of instructional support services, and one to the fiscal office. Three indicated that projection was primarily the responsibility of the deputy superintendent or a special assistant to the superintendent.

Eleven respondents claimed that no one else has direct input into projections, while sixteen said no one else had indirect influence. Principals were the most common persons named as having direct input (15 replies) and indirect input (10 replies). Upper administration officials (directors, assistant superintendents, superintendents, etc.) were the next most frequently named in both categories. Other offices within the district administration were frequently mentioned as both direct and indirect contributors to the final projections. These included area offices, elementary and secondary education departments, Special Education departments, and finance offices. (It is interesting that, whereas budget planning is reported as the main use for projections, finance offices are very seldom involved in producing the numbers.) A few respondents receive input (usually indirect) from city or county officials, while even fewer consult state officials.

Accuracy of projections

When asked about the accuracy of their one-year projections, two-thirds of the respondents said they aim for an overall error rate of one percent or less. That is, total district enrollment should be within 1% of the projection. One-fifth of the respondents (including both authors) aim for less than 1/2 of 1% error. Grade-by-grade (district-wide) figures are not as accurate, nor are individual school projections. Two-thirds of respondents aim for errors of 4% or less for individual grades (a further quarter of the respondents marked this item "N/A"), while half considered an error rate of 3-5% to be acceptable for individual school figures. Projections farther into the future are also made with less confidence. One-quarter did not quote an error rate for two- to five-year projections. Those claiming an error rate of 1% or less for one-year projections usually raised that error rate to 3 % for two- and three-year projections and to 4 or 5% for four- and five-year projections.

Uses for projections

The primary uses reported for enrollment projection were budget development and personnel planning (100 % of those answering this question). Building utilization was the next most common response (50 % of those responding), followed by transportation and capital improvement planning (35% each). Other common uses for projections were textbook and supply allocation, program

planning, and student assignment decisions (including boundary changes). Two districts in our sample report their projections to state authorities, while one reports them to the District Court as a result of court-ordered desegregation rulings.

In reporting the uses for projections, several respondents distinguished between long-term and short-term projections. Long-term projections, when they are done, are used primarily for planning new buildings, bond issues and the like, while short-term projections serve most of the other purposes cited above.

Methods of projection

At the risk of oversimplifying Holy's classification, we could say that two general approaches might be taken in divining future enrollments. One, projection, uses historical data on births and enrollments and projects that trends in the data will continue. The other, prediction, combines this historical data with other variables thought to influence enrollments, usually in some form of multiple regression equation. The first of these is used by virtually every one of our respondents, who usually called this method either the cohort survival method or the grade retention method. Briefly stated, this method uses historical survival ratios from grade to grade as the basis for prediction. Kindergarten is projected from births five years previous.

The ways in which the method is applied vary widely. Some begin by projecting each school, then summing them to get a district total (a bottom-up approach). More often, district-wide enrollments are projected first, then school enrollments are projected based on current percentages of district enrollment in each school (a top-down approach). Several districts do not attempt school-by-school projections, but project areas of the city and leave further detail to area superintendents. A few districts (especially those with input from principals, area superintendents, etc.) project district-wide and school enrollments independently, then reconcile the two.

None of our respondents use a single year's survival ratios for projections, but average the ratios from several years. Most often, the mean of the three most recent years' ratios is used, although one district reported using a two-year average and several use a four-year average. Some districts use weighting schemes which give the heaviest weights to the most recent ratios. A few districts report

examining several such averages before selecting the one to project next year's enrollments.

Two districts in our sample predict enrollments more than five years in the future. In both cases, regression techniques were used to determine trends in the birth rate (linear, exponential, logistic) and to predict birth rates which are used to estimate future kindergartens.

Most districts reported some use of computers in the projections, but no single piece of software seems to be in widespread use. Some districts have written their own programs, some use commercial spreadsheets, and a few use projection programs that are commercially available (three programs available from universities were mentioned). A few districts reported extensive geographic databases which help improve the precision of individual school projections and which allow accurate projections when boundaries change or new schools are built.

Special considerations in projection

Many factors were reported as influencing enrollment change. However, most respondents reported that they expect the cohort survival method to compensate for these, at least for district-wide figures. As one respondent put it, "The Grade-Succession Method is based on the assumption that the future will not vary significantly from the past." Therefore, the enrollment projector must be aware of those factors influencing enrollments only when their established pattern changes quickly. For instance, mobile populations generally average out. However, a few districts reported problems due to economic factors that resulted in sudden changes in in-migration or out-migration. Such factors as non-public school enrollments need not be considered unless they are likely to change (usually due to tuition increases, school closings, etc.). Other district-wide influences mentioned included changes in district boundaries and changes in promotion policy. In these cases, the projector must remember not to average survival ratios across those events.

Building-level projections require more adjustments than do district figures. Many common problems were mentioned, the most frequent being open-enrollment or district-wide magnet schools. These schools draw students away from one area and into another. A related problems is court-ordered desegregation, which was mentioned by a handful of districts. Both of these factors result in large percentages of students attending other than their neighborhood schools. Our respondents generally

assume that patterns, once established, will continue, so such schemes are only a problem for their first year or two of operation. Rapid population shifts within the district, changes in attendance areas, and opening or closing of schools were other factors that were frequently mentioned in school-by-school projections. These all cause some short-term problems similar to those raised by magnet schools. There is little historical data on which to base projections, so projectors utilize what data is available to make subjective estimates for the first year or two, then count on established patterns to continue. Finally, enrollments in special education programs and relocations of such programs must be factored into projections.

The fine-tuning of projections to compensate for these special considerations seems to be a highly subjective process for our respondents. Several reported a formal revision (usually in March or April) of the original estimate, but many simply listed the factors they must consider and indicated that these were things they had to keep in mind when adjusting their estimates. The subjectivity of this part of enrollment projection may well be a major reason that so little has been written on the subject.

George J. Collins and LaMoins Langston in "Guesstimating Future School Enrollments" provide a summary statement that all involved with enrollment projections should keep in mind, "In summary, it may be noted that there are many factors which can influence the trends or increases or decreases in school enrollment. All methods take time, effort, and good common sense."

A GENERAL MODEL FOR ENROLLMENT PROJECTION

The method for projecting enrollments presented below is a synthesis of techniques reported by our respondents, liberally influenced by the biases of the authors. The method combines top-down and bottom-up techniques. It requires access to a good microcomputer spreadsheet, as well as considerable knowledge of the local district and a modicum of common sense.

Enrollment projection begins with the gathering of at least five (preferably six) years' worth of historical enrollment data. This history needs to contain the same level of detail as is desired in the projections. For example, if the projections are to be grade-by-grade, school-by-school, the data must show grade and school enrollments for five years. If the projections must also show racial beakdowns, the historical data must include this as well. Our examples will show enrollments by grades within schools.

District-wide enrollments

The first numbers to be projected are district-wide grade totals. We strongly recommend examining several alternative projections before deciding on the final numbers. At the district-wide level, these are easily computed using a spreadsheet like the one in Figure 1. This example used MicroSoft Excel operating on a Macintosh computer, but any good-sized spreadsheet will do.

Insert Figure 1 about here.

The first numbers to be entered are the six years of enrollment history beginning with "5 yr. ago" on page 1. The lower half of this page is filled with formulas which are used to compute the five years of projection in the upper right. First, the "SURVIVAL RATIOS" are simply ratios of one grade's enrollment to that in the previous grade the year before (Grade 1 four years ago to kindergarten five years ago, etc.). The "AVERAGED RATIOS" give us several choices for projecting future enrollments. The averages shown in our example are those of the last five years, the last four years, the last three years, the highest four of the last five, the lowest four of the last five, and an average which

gives the most recent year's ratios a weight of 4, the previous year's a weight of 3, etc.

Once the survival ratios and their averages have been computed, we can compute the "CHOICES FOR PROJECTIONS" at the bottom of page 1 and the top of page 2 of our example. These are the product of the appropriate averaged ratio and this year's enrollment in the prior grade (e.g. the first ratio under "last 5" multiplied by this year's kindergarten produces the Grade 1 number under "last 5" in "CHOICES . . .").

Now comes the first point of human judgment. The enrollment projector must decide which of these projections is most likely. Both authors have found that the most reliable method is to simulate a projection of the current year's enrollment, decide which set of ratios would have given the most accurate prediction, and use it for next year. Very seldom do trends change so quickly that they are not accounted for in the averages. (In only one year of either authors' experience would this technique not have been adequate. That was a year in which a major refugee influx began in mid-year. Fortunately, we were able to note this change through contact with other offices in the district and adjust our projections accordingly.)

Kindergarten projections are handled much the same way as the other grades, except that we use the ratio of kindergarten children to births five years previous. The bottom of page 2 shows monthly birth data and allows a choice of three projections for the next five years' kindergartens.

Once the enrollment projector has chosen which kindergarten projections to use, these are transferred to the projection columns at the top of page 1 and formulas are written into the remaining cells (multiplying the averaged survival ratios by previous grades' enrollments). This ends the top-down phase of projection.

School-by-school enrollments

Two approaches can now be taken to deriving school-by-school enrollments. The first, a straight top-down approach, would allocate students to the schools based on the percentage of each cohort that is in each school this year. These figures could then be modified based on the judgments of the enrollment projector, principals, and others who might have knowledge of special considerations in each building. Other than these judgments, this approach is a simple matter of arithmetic.

A second approach produces school-by-school figures independently from the district figures, then adjusts them to fit the district-wide projections. The approach we are about to explain is not so strictly mathematical as that shown for district figures. It is also much more time-consuming and involves a great deal of personal judgment.

Figure 2 shows a single elementary school's section of a spreadsheet used for this purpose. (As this spreadsheet becomes very large, we use separate sheets for elementary and secondary schools.)

Insert Figure 2 about here.

It would be possible to enter formulas into each cell under "next year", just as in the district-wide spreadsheet. It is our opinion that this approach would fail to use much valuable information that the projector carries mentally. We prefer to work school by school through the spreadsheet, examining the changes of the past three or four years, then enter our best guesses (yes, guesses) for next year's enrollments. In the example shown, the school's incoming kindergartens have been growing, but the school routinely loses a few children as cohorts move through the first three grades (look diagonally from Grade 1 in one year to Grade 2 the next, etc.). We enter figures that show this trend continuing.

We compute district-wide totals on this spreadsheet, note differences from the district figures previously computed, and make adjustments. It usually takes three passes through the school-by-school spreadsheet before the figures agree. We urge that, in reconciling school and district figures, the school figures should be adjusted. District-wide ones should not be changed. The district figures involve fewer of the projector's biases and are likely to be more stable in any case, being based on larger numbers. We do not advocate projecting school-by-school enrollments more than one year ahead.

The method just expounded may seem hopelessly imprecise. Unfortunately, most school districts have so many variables influencing individual school enrollments that no other method is likely to account for all of them any more efficiently. Some computerized aids, such as a complete geographical database, can be a major aid in achieving precision, but the factor of human judgment probably cannot be replaced by any computational means.

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Figure 1 District-Wide Projection

PROJECTIONS to 87-88

ACTUAL		5 yr. ago	4 yr. ago	3 yr.ago	2 yr. ago	1 yr. ago	this year	PROJECTED	next year	2yr. hence	3 yr. hence	4 yr. hence	5 yr. hence	
ENROLLMENTS								ENROLLMENTS						
	K	2197	2281	2300	2523	2860	3023	K	2964	3037	2897	3073	3000	
	1	2201	2213	2246	2392	2628	2906	1	3085	3025	3100	2957	3137	
	2	2095	2073	2084	2191	2342	2504	2	2796	2969	2911	2983	2845	
	3	2136	2021	1997	2088	2199	2299	3	2473	2761	2932	2875	2946	
	4	2134	2088	1969	1984	2054	2235	4	2281	2453	2739	2908	2852	
	5	2323	2123	2096	1963	2011	2053	5	2243	2289	2462	2749	2919	
	6	2320	2271	2091	2072	2014	2029	6	2057	2247	2293	2467	2754	
ELEMENTARY														
TOTAL	K-6	15406	15070	14785	15213	16108	17049	K-6	17899	18781	19334	20012	20453	
	7	2141	2238	2279	2149	2114	2093	7	2075	2104	2298	2345	2523	
	8	2193	2265	2330	2351	2221	2202	8	2170	2152	2182	2383	2432	
JR. HIGH														
TOTAL	7-8	4334	4503	4609	4500	4335	4295	7-8	4245	4256	4480	4728	4955	
	9	2244	2251	2354	2348	2362	2148	9	2212	2180	2162	2192	2394	
	10	2432	2281	2357	2424	2424	2316	10	2196	2262	2229	2210	2241	
	11	2596	2492	2219	2212	2255	2311	11	2197	2083	2146	2115	2097	
	12	2495	2413	2284	2105	2137	2100	12	2174	2067	1959	2019	1989	
SR. HIGH														
TOTAL	9-12	9767	9437	9214	9089	9178	8875	9-12	8779	8592	8496	8536	8721	
TOTAL	7-12	14101	13940	13823	13589	13513	13170	7-12	13024	12848	12976	13264	13676	
TOTAL	K-12	29507	29010	28608	28802	29621	30219	K-12	30923	31629	32310	33276	34129	
									last 5	last 4	last 3	weighted 4	high 4	low 4
	K-1		1.0073	0.9847	1.0400	1.0416	1.0161		1.0179	1.0206	1.0326	1.0254	1.0262	1.0120
	1-2		0.9418	0.9417	0.9755	0.9791	0.9528		0.9582	0.9623	0.9691	0.9641	0.9623	0.9530
	2-3		0.9647	0.9633	1.0019	1.0037	0.9816		0.9830	0.9876	0.9957	0.9905	0.9880	0.9779
	3-4		0.9775	0.9743	0.9935	0.9837	1.0164		0.9891	0.9920	0.9979	0.9978	0.9928	0.9823
SURVIVAL	4-5		0.9948	1.0048	0.9970	1.0136	0.9995	AVERAGED	1.0019	1.0037	1.0034	1.0038	1.0037	0.9990
RATIOS	5-6		0.9776	0.9849	0.9876	1.0260	1.0090	RATIOS	0.9970	1.0019	1.0075	1.0074	1.0019	0.9898
	6-7		0.9647	1.0035	1.0277	1.0203	1.0392		1.0111	1.0227	1.0291	1.0277	1.0227	1.0040
	7-8		1.0579	1.0411	1.0316	1.0335	1.0416		1.0411	1.0370	1.0356	1.0371	1.0435	1.0370
	8-9		1.0264	1.0393	1.0077	1.0047	0.9671		1.0091	1.0047	0.9932	0.9937	1.0195	1.0015
	9-10		1.0165	1.0471	1.0297	1.0324	0.9805		1.0212	1.0224	1.0142	1.0126	1.0314	1.0148
	10-11		1.0247	0.9728	0.9385	0.9303	0.9534		0.9639	0.9487	0.9407	0.9454	0.9723	0.9407
	11-12		0.9295	0.9165	0.9486	0.9661	0.9313		0.9384	0.9406	0.9487	0.9437	0.9439	0.9315
		last 5	last 4	last 3	weighted 4	high 4	low 4	86-87						
	K							3023						
	1	3077	3085	3121	3100	3102	3059	2906						
	2	2785	2796	2816	2802	2796	2769	2504						
	3	2462	2473	2493	2480	2474	2449	2299						
CHOICES FOR	4	2274	2281	2294	2294	2282	2258	2235						
PROJECTIONS	5	2239	2243	2243	2243	2243	2233	2053						
	6	2047	2057	2068	2068	2057	2032	2029						
total	1-6	14883	14935	15036	14987	14955	14800	14026						

Figure 1 District-Wide Projection Continued

PROJECTIONS to 87-88

	7	2051	2075	2088	2085	2075	2037	2093						
	8	2179	2170	2167	2171	2184	2170	2202						
	9	2222	2212	2187	2188	2245	2205	2148						
	10	2194	2196	2179	2175	2215	2180	2316						
	11	2232	2197	2179	2190	2252	2197	2311						
	12	2169	2174	2192	2181	2181	2153	2100						
total	7-12	13047	13025	12992	12990	13153	12943	13170						
	"													
		75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	84-85	85-86	86-87	87-88
	K	3246	2837	2404	2309	2132	2227	2197	2281	2300	2523	2860	3023	
	1	2786	2802	2493	2215	2150	2140	2201	2213	2246	2392	2628	2906	
	2	2601	2526	2587	2364	2098	2147	2095	2073	2084	2191	2342	2504	
	3	2462	2447	2396	2418	2290	2129	2136	2021	1997	2088	2199	2299	
	4	2604	2306	2303	2299	2320	2292	2134	2088	1969	1984	2054	2235	
ENROLLMENT	5	2577	2447	2218	2237	2198	2331	2323	2123	2098	1963	2011	2053	
HISTORY	6	2773	2471	2329	2133	2161	2157	2320	2271	2091	2072	2014	2029	
	7	2986	2535	2301	2184	2019	2169	2141	2238	2279	2149	2114	2093	
	8	2947	2771	2425	2226	2122	2071	2193	2265	2330	2351	2221	2202	
	9	3319	3077	2854	2580	2412	2274	2244	2251	2354	2348	2362	2148	
	10	3537	3395	3178	2891	2634	2534	2432	2281	2357	2424	2424	2316	
	11	3588	3383	3220	3035	2776	2623	2596	2492	2219	2212	2255	2311	
	12	3402	3344	3073	3007	2921	2766	2495	2413	2284	2105	2137	2100	
		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	
Births—Jan.								371	406	407	392	417	416	
Births—Feb.								358	394	382	390	363	405	
Births—Mar.								389	425	419	471	414	458	
Births—Apr.								357	411	357	417	395	420	
Births—May								401	444	468	428	429	461	
Births—Jun.								397	447	385	441	446	453	
Births—Jul.								450	434	432	448	444	440	
Births—Aug.								419	441	440	416	439	456	
Births—Sep.								408	449	451	371	433	421	
Births—Oct.								449	456	452	409	436	427	
Births—Nov.								404	402	424	374	410	402	
Births—Dec.								399	415	405	397	408	383	
Births—total														
Sept.-Aug.									5062	5012	5135	4898	5196	
Jan.-Dec.		4059	3872	3790	4026	4021	4338	4802	5124	5022	4954	5034	5142	
ratio to K														
5 yr. later		52.53%	57.52%	57.97%	56.66%	57.20%	58.16%	59.56%	59.72%					
CHOICES														
last 5						1807	2445	2761	2931	2920				
last 4						2258	2487	2761	2931	2940				
last 3						2307	2485	2753	2951	2964				
ACTUAL						2300	2523	2860	3023					
										1987	1988	1989	1990	
PROJECTION								(ratio births-K)—	0.591461	2964	3037	2897	3073	

Figure 2 Single School Projection

		3 yr. ago	2 yr. ago	1 yr. ago	this year	next year
DAYTON'S BL	K	95	103	136	123	124
DAYTON'S BL	1	106	96	108	113	105
DAYTON'S BL	2	103	92	83	92	100
DAYTON'S BL	3	80	91	88	86	91
DAYTON'S BL	4	87	79	75	95	93
DAYTON'S BL	5	87	83	70	69	89
DAYTON'S BL	6	86	83	81	81	74
DAYTON'S BL	K-6	644	627	641	659	676

APPENDIX

SURVEY ON ENROLLMENT PROJECTIONS

District Characteristics

What was your district enrollment at the end of September, 1985? _____
What was your enrollment one year earlier? _____
Approximately what percentage of your enrollment are minority students (Native American, Asian, Black, or Hispanic)? _____

Responsibility

Who has primary responsibility for enrollment projections in your district (i.e. What is your title?) _____.
Who else has direct input into the process? _____
_____
Are there people who do not have direct input, but whose comments can influence your final projection? _____ If yes, who are they? _____
_____
In what month does your budget year begin? _____
When do you make your initial projections for the next school year? _____
Do these projections often undergo substantial revision as the new school year approaches? _____
If so, what leads to revisions and what types of revisions do you make? _____
_____
_____

Accuracy

Fill in the following blanks with what you consider to be an acceptable accuracy rate for each situation. Figure the accuracy rate as a percentage of your total projection. That is, if you say that 5% is an acceptable rate, you are telling us that it is acceptable for actual enrollment in that particular situation to be above or below your projection by 5% or less. Mark "N/A" for any accuracy rate that you do not consider important.

Next year total, district-wide _____ Next year total, individual school_____
Next year, one grade, district-wide_____ Next year, one grade, individual school_____

Two or three year projection, total district enrollment _____
Four or five year projection, total district enrollment _____

Methodology

Describe briefly the method you use in projecting enrollments. In our summary, we hope to be able to answer some of the following questions :

—Do different sizes of districts use different methods?

—Is enrollment projection most often top-down (district totals first, then school-by-school) or bottom-up?

—What techniques are used to arrive at initial estimates? What computer software and databases are used?

—What considerations enter into the fine-tuning of these estimates?

—Are the techniques used for long-term projections different than those used for single-year projections?

Special Considerations

What problems or special considerations must enter into your projections (e.g. questions of racial balance, open enrollment policies, competition from non-public schools, highly mobile populations)? How do you build these factors into the projection?

Uses

Describe the three or four principal uses that you see people making of your projections (e.g. budget development, staffing, transportation).